Pesticide Analytic and Response Center

Highway 36 Exposure Investigation Proposal

Project Period August 1, 2011-July 31, 2012

A comprehensive exposure investigation will require multiple sources of data combined to answer the following questions:

1. Are residents in the Triangle Lake/Hhy 36 area being exposed to pesticides? ~~from local application practices?~~
2. To what extent are they being exposed?
3. How are they being exposed?
4. What are they being exposed to?
5. What are the source(s) of the pesticides they are being exposed to?
6. What, if any, ~~observed~~ health effects may be attributable to these exposures?

Study Design

The data need to answer these questions include:

- Biomonitoring data
  - Human
  - Animal
- Environmental data
  - Domestic (food source) plants
  - Wild plants
  - Drinking water
  - Air
- Pesticide Application data
  - Application Records
  - Spray drift model

Comment [FS1]: EPA agrees that the air sampling is a high priority to determine how residents are being exposed. How air sampling is going to be conducted and funded is still being investigated.

Comment [FS2]: Which model is this referring to? Existing models may have limitations in this geographic region due to its unique topography and meteorological conditions.

Figure 1. Conceptual model for the proposed study

Analytes	Population Frame	Data		Time Frame					
				SE1 (Mid Aug. - Sept.)		SE2 (Oct. - Feb.)	SE3 (Mar. - May)		SE4 (June-July
				Pre-Spray	Post-Spray (one event)		Pre-Spray	Post-Spray (one event)	
Full DEQ Suite for pesticides/ herbicides	Volunteers from Traingle Lake/Hwy 36 area	Environmental Sampling	Drinking water sources: Groundwater and surface water	X	X_{24-48}	X	X	X_{24-48}	X
				Planned approach is to conduct one drinking water sampling event in 2011.					
			Plants: Wild Foliage	X	X_{24-48}	X	X	X_{24-48}	X
				Drinking water sampling is not dependent on timing of spray events. Additional drinking water sampling may be conducted in the future					
			Food: Garden plants; fish; milk	X	X_{24-48}	X	X	X_{24-48}	X
				depending on the results of the first phase of sampling.					
			Ambient Air: Passive sampling	X	Refer to previous comment on air sampling.	X	X	X	X
			Air: Active (personal) sampling		X_{24-48}			X_{24-48}	
		Human Biomonitoring	Urine	X	X_R		X	X_R	
		Health		Review of available registry and vital records data					
		Other			Drift Study^ Observational Records			Drift Study^ Observational Records	

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The study will collect samples over the course of a year, beginning in with the Summer/Fall spray season. During the spray-event periods, samples will be collected pre- and post- spray event. In the off-season, samples will be collected once.

Recruitment and Data Collection

1. Geographic area will be identifed by ODF based on the timber units that have been harvested and are likely to likely to have aerial applications in the Summer/Fall 2011 and

Winter 2012 time period. They are confident that we can identify residences that are near (within ½ mile) units that are slated for sprays.

a. The 2011 fall spray season will begin in mid-August and end in September/early October. The 2012 spring spray season will begin in March and last through May.

b. Owners will spray different units, and use different chemicals, during the fall and spring seasons. Most of this spray is aerial, though there may be other spray activities (e.g., roadside spraying) nearby.

c. A spray unit is usually 35-40 acres in size.

d. Owners will spray different units, and use different chemicals, during the fall and spring seasons. Most of this spray is aerial, though there may be other spray activities (e.g., roadside spraying) nearby.

2. Residents, (including both owners and renters) will be eligible to be considered for inclusion in the study is they live within the identified geographic boundary of the study area.

   a. 28 Participants will be selected from within the study area, spatially distributed over the area so ~~so~~ as to be representative of the population in the study area.

   b. 2 additional participants will be selected from outside the study area, where it is certain that no aerial applications have been made to local lands.

3. Participants will be informed of the requirements to participate in the study, including the collection of personal and environmental samples from them and their residences.

   a. Participants will complete a baseline survey to identify: drinking water sources, home pesticide use, food sources (e.g., garden plants, fish, game, milk), etc.

4. # (TBD) environmental samples will be collected for each participant, to include drinking water sources, residential plant food sources (e.g., garden plants), residential animal food sources (e.g. fish, game, milk) and air.

5. # (TBD) additional environmental samples (e.g. groundwater, surface water, foliage, air) will be collected during each sampling event, evenly distributed over the study area.

Comment [FS3]: In addition, EPA will require each resident to sign a standard access/consent agreement before a drinking water sample will be collected.

Comment [FS4]: See previous comment regarding air sampling.

Comment [FS5]: See previous comment regarding air sampling. At this time, no groundwater sampling, exclusive of drinking water, is planned. Surface water sampling may be conducted in the future as part of an ecological evaluation.

Additional notes on drinking water sampling:

EPA and DEQ will jointly develop a QAPP/SAP based on DEQ's TMP/PSP Umbrella QAPP.

EPA will develop a health and safety plan for EPA personnel.

EPA will collect and DEQ will analyze up to 3 batches (60 samples) including QA/QC samples. Assuming a collection rate of 10% duplicates and approximately 5% QC samples, this will allow for collection of up to approximately 50 drinking water samples. We plan to include the 30 participants to be identified by OHA, residents who provided urine samples to Dr. Barr, and other volunteers based on some yet to be refined criteria (such as proximity to timber units, location relative to groundwater flow direction, well construction information if available, etc.)

Timeframes for Sample Collection

Spray Off-season (Summer/Winter)

Time frame (Days)	Survey/ Obs. Logs		Human urine		Ambient air		Drinking water supply		Surface Water		~~Ground water~~		Wild Foliage		Food: Garden plants		Food: Fish		Food: Milk, eggs	
<-4																				
-3																				
-2							X	?	X	?	~~X~~	~~?~~	X	?	X	?	X	?	X	?
-1	X	**OHA**			X	?	X	?	X	?	~~X~~	~~?~~	X	?	X	?	X	?	X	?
0*	X	**OHA**	X	**OHA**	X	?	X	?	X	?	~~X~~	~~?~~	X	?	X	?	X	?	X	?
1	X	**OHA**			X	?	X	?	X	?	~~X~~	~~?~~	X	?	X	?	X	?	X	?
2							X	?	X	?	~~X~~	~~?~~	X	?	X	?	X	?	X	?
3																				
>4																				

*While timing is less critical than during spray season, it would be ideal if all sampling is conducted in a limited time frame.

Spray On-season (Fall/Spring)

Time frame (Days)	Survey/ Obs. Logs		Human urine		Ambient air		Drinking water supply		Surface Water		Ground water		Wild Foliage		Food: Garden plants		Food: Fish		Food: Milk, eggs	
<-4																				
-3																				
-2			X	**OHA**													X	?	X	?
-1	X	**OHA**															X	?	X	?
0 (SPRAY)	X	**OHA**			X	**EPA**	X	?	X	?	X	**EPA**	X	?	X	?	X	?	X	?
1	X	**OHA**			X	**EPA**	X	?	X	?	X	**EPA**	X	?	X	?	X	?	X	?
2			X	**OHA**	X	**EPA**	X	?	X	?	X	**EPA**	X	?	X	?	X	?	X	?
3							X	?	X	?	X	**EPA**	X	?	X	?				
>4							X	?	X	?	X	**EPA**	X	?	X	?				

Comment [FS6]: Under development. Funding source has not yet been identified.

Comment [FS7]: Future phase.

Protocol Notes

1. OHA collects urine sample and administers short survey (Day 0 = day of urine collection; survey may be administered before or after)
2. ODF sends OHA notification of spray event in units near project homes (Days -1 or 0)
3. OHA asks homeowners to complete observational log/survey (Day 0)
4. OHA collects human urine samples (Days 1-2)